ACC.13
62nd Annual Scientific Session & Expo
TCT@ACC-i2

E1105
JACC March 12, 2013
Volume 61, Issue 10

Imaging

INFLUENCE OF CORONARY CALCIFICATION ON THE ACCURACY OF DUAL SOURCE CT FOR CORONARY STENOSIS DETECTION IN PATIENTS WITH INTERMEDIATE LIKELIHOOD OF DISEASE: RESULTS OF THE INTERNATIONAL MULTICENTER MEDIC TRIAL

Moderated Poster Contributions
Poster Sessions, Expo North
Monday, March 11, 2013, 9:45 a.m.-10:30 a.m.

Session Title: Imaging: CT/Multimodality IX
Abstract Category: 20. Imaging: CT/Multimodality
Presentation Number: 1314M-351

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Introduction: We analyzed the results of an international multicenter trial ("Multicenter Evaluation of Dual source CT coronary angiography in patients with Intermediate likelihood of Coronary artery stenoses" - MEDIC) to determine the influence of coronary calcification on the accuracy of dual source coronary CT angiography.

Methods: In 6 international sites, 415 patients (with intermediate likelihood of coronary stenoses, no renal failure, no arrhythmias, Agatston score less than 800) were investigated by contrast-enhanced DSCT in spiral mode without beta blockade and by invasive coronary angiography. Both modalities were analyzed concerning the presence of at least one coronary artery stenosis > 50% on a per-patient basis.

Results: In the entire patient group, sensitivity of DSCT for the detection of individuals with at least one coronary artery stenosis was 95% (104/110) and specificity was 95% (289/305). Patients were divided in three subgroups; patients with zero Agatston score (162 patients, group 1), patients with Agatston score between 1 and 399 (204 patients, group 2) and patients with Agatston score ≥ 400 (49 patients, group 3). Mean heart rate was not significantly different in the three subgroups. Prevalence of significant coronary artery disease was 8%, 33% and 59%%, respectively. The sensitivity of DSCT for the detection of individuals with at least one coronary artery stenosis was 100% (13/13), 94% (65/69) and 97% (28/29) for groups 1, 2 and 3, respectively ($p < 0.0001$). Specificity was 98% (146/149) for group 1 versus 93% (125/135) and 90% (18/20) for groups 2 and 3, respectively ($p < 0.0001$). Accuracy was 98%, 93% and 94% for groups 1, 2 and 3, respectively.

Conclusions: In the largest multicenter trial to date concerning the detection of coronary artery stenoses by CT angiography, dual source CT demonstrated a high accuracy independent of coronary calcification. Accuracy was highest in patients without coronary calcification, who still had a prevalence of obstructive coronary artery disease of 8%. In patients with mild to moderate and severe calcification, accuracy was slightly lower. While a high sensitivity was maintained, specificity decreased with increasing calcium scores.